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ABSTRACT

Research investigated the effect of participation by college students in the "School Game" upon changes in their attitudes toward educational games. The simulation game used was based on Kelman's theory of social influence and attitude change in which three processes--compliance, identification, and internalization--produce attitude change. Content was drawn from Roger's "Freedom to Learn" and from Postman and Weingartner's "Teaching as a Subversive Activity". College students' attitudes after playing the "School Game" became significantly more positive toward statements which held that: 1) Games promote positive affect; 2) The class meeting was an exciting instructional session; and 3) Teachers should use learning games. Their attitude toward a fourth statement that games promote learning was neutral. Control group attitudes did not change significantly. It was concluded that Kelman's theory was applicable to gaming/simulation situations. In addition, in the light of the results on the fourth variable it seemed that it would be helpful to reemphasize that learning includes attitude changes, so that students will internalize their changed attitudes as learning brought about by participation in the game. (PB)

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Social Influence through Simulation: Changing Attitudes with the School Game

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Producing or controlling the direction of attitude change is very often a difficult task. One assumption frequently made when attempting to "change" people is that if we were only able to change attitudes, a whole variety of behavioral changes would result. An alternative view is that attitudes <u>follow</u> rather than precede behavior. Instead of behaving a certain way because he holds an attitude, Bem suggests that the individual infers his attitude by observing his behavior. (1) In effect, one asks oneself the question, "What must my attitude be if I behaved that way?"

The social influence "School Game" seeks to engage teachers or prospective teachers in the process of advocating the adoption of innovative procedures in their real or anticipated school. The primary technique employed is known as "counter-attitudinal roleplaying" in social psychological experimentation. The basic idea is to get the individual to "freely" engage in behavior which may conflict with his actual attitudes during his attempt to influence the other. The predicted result of counterattitudinal role-playing is that the person will (with or without awareness) change his attitudes so that they are more in agreement with his actual behavior.

Some of the most important objectives in an introductory course in the social sciences concern the intent (a) to get the student "thinking" psychologically, or sociologically etc., and, (b) at a minimum, to have him become conversant with major issues before the discipline, at the same time, hopefully, (c) to lead him to challenge his established presuppositions, while we (d) encourage him to try on, test or adopt the "worthwhile" discoveries of the discipline as a higher base for furthering independent inquiry.

With these objectives in mind, the "School Game" was designed to have the student involved actively with the content of controversial education proposals, while evaluating the

merits of specific proposals in the light of both research data acquired earlier in the course and his personal experience. Practice is gained in advocating the adoption of some educational proposals which have aspects consistent with available social science knowledge. An attempt was made to select a successful simulation gaming structure within which a variety of different content or specific proposals could be inserted. The game was specifically designed for application in at least two settings: (1) in-service teacher training, as might be conducted during a short meeting after school with experienced teachers, and (2) for use with prospective teachers enrolled in a beginning course in educational psychology.

Rules and Procedures for the School Game

The following procedures are also graphically illustrated in the Flow Chart (Fig. 3) and reference to the playing board (Fig. 1) and sample cards (Fig. 2) will clarify the game progression.

1. The objective is to win by moving your player along the spaces of the board so fast that you get out of school first!
2. Select a player (paper clip). Throw the dice to determine who goes first.
3. Move ahead the number of spaces showing on the dice.
4. When you land on a space that has something written on it, follow those instrctions faithfully (obey). Just like you do in real "School"....
5. There are four kinds of spaces: BLANK SPACES, EVENT DRAW, KNOWLEDGE DRAW, and FREE DRAW. When you land on these spaces, you should draw one of the cards, and DO THE FOLLOWING:

BLANK SPACE-Rest and relax.

EVENT DRAW-Follow the instruction printed on the card. You may be told to move to another place on the board, move ahead, lose a turn, be quiet for one turn, etc.

KNOWLEDGE DRAW-Indicate to the other players whether or not you agree or disagree with the statement printed on the card. (Students decided what the right answers were.) Turn the card over to check your answer. If your answer is correct, you get to move ahead.

FREE DRAW-Imagine you are a teacher in a faculty meeting. Your task is to convince as many other teachers that the proposals printed on the card are practical and should be immediately implemented in you school. All of the proposals were taken from the school "Suggestion Box."
(Please note: Anyone could have made the suggestion, including students, teachers, the principal, parents, taxpayers, the janitor, etc.)
YOU HAVE ONE MINUTE TO PERSUADE THE PLAYERS TO VOTE TO IMPLEMENT THE PROPOSAL. (note: Appoint a timekeeper) VOTE. (Your vote doesn't count). MOVE AHEAD THE SAME NUMBER OF SPACES AS THERE ARE VOTES WON.

6. A round of the game is over as soon as one player gets to space #46 "School's Out". Everybody begins at the starting point again.
7. Put the cards back in the right envelope when the game is over. Please return all materials to the non-white big envelope. Thanks.

The general format of the School Game can readily be adapted to a different type of organization by merely changing the game title, relabeling Event Cards and board spaces to conform to everyday occurences in the setting, while simultaneously changing the Knowledge Cards so the established assumptions are questioned, and having particpants advocate adoption of creative, radically innovative proposals which are offered on the revised Free Draw Cards.

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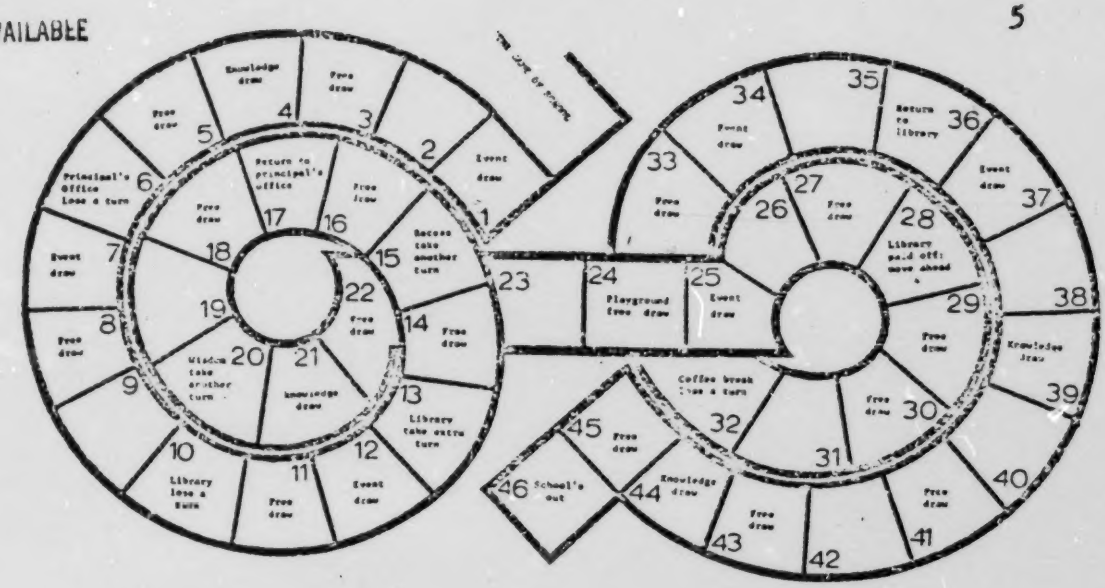

Figure 1. Playing board for "School Game"

Event cards:

Stomach ache: Go to the nurses office (located two spaces behind where you are).	Busywork assignment. Stay where you are.

Knowledge cards:

Front:	Back:
Weeding out a majority of students is a satisfactory method of producing good scientists and clinicians.	If you disagreed, move ahead two spaces.
Knowledge is not accumulation of brick upon brick of content and information.	If you agreed, move ahead two spaces.

Free-draw cards:

Front:	Back:
Classify teachers according to their ability and make the lists public	You have one minute to convince other players that this suggestion should immediately be implemented. You move ahead as many spaces as the number of players you convinced.
Have English teachers teach math, math teachers teach English, and so on.	You have one minute to convince other players that this suggestion should immediately be implemented. You move ahead as many spaces as the number of players you convinced.

Figure 2. Sample cards from "School Game"

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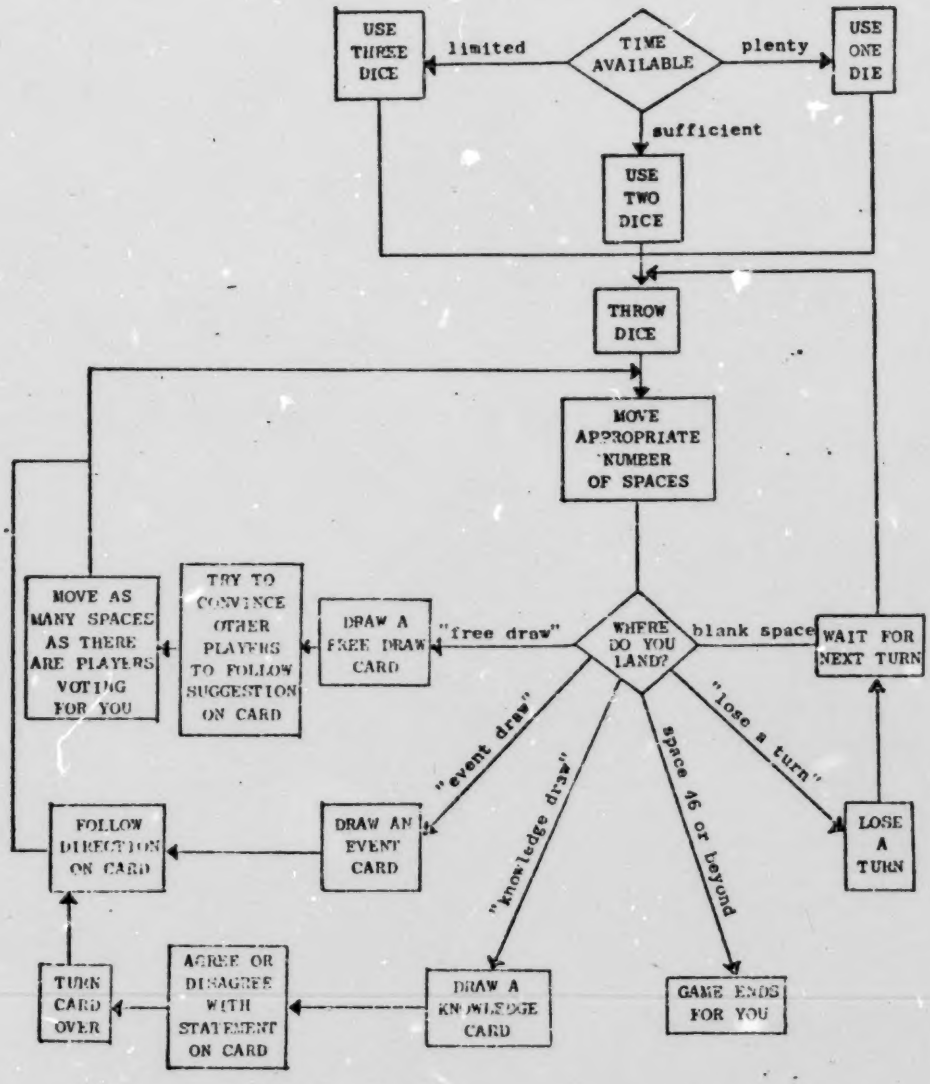


Figure 3. Play procedure for "School Game"

Design of the "School Game"

The "School Game" is a board game which involves role playing, whose obvious purpose is to land on the winning space first. The general scenario for the game is assumed to be a teacher's lounge, with players cast in roles as teachers who are rolling the dice to see who can move along the board fastest to get out of school first. Success is dependent not only on the throw of the dice, but upon skill in (1) guessing which assumptions about school students are likely to agree with, and (2) persuading others that "radical" recommendations for improving the school should be immediately implemented. The proposals have supposedly come to the faculty via a school "suggestion box" to which anyone may have anonymously contributed including parents, taxpayers, students, teachers, principals, businessmen, etc.

The equipment of the School Game consists of the following items: Playing board, dice, paper clips from which players are constructed, and Event, Knowledge, and Free Draw cards. One game board, set of dice, and cards is required for every 2 to 7 players.

The actual content for the cards drawn when a player lands on certain spaces was taken from three primary sources. The general outline of the game board and "Event Cards" were selected from the book Will the Real Teacher Please Stand Up? (Greer and Rubinstein, 1972, pages 18-21) or suggested by some of the everyday occurences of daily school routines: examples include being sent to the principal's office, going to the library, or losing a turn for breaking a rule. "Knowledge Cards" were based on assumptions challenged by Carl Rogers in his book Freedom to Learn, from Chapter 8 in which he advances the groundwork for an "innovative" graduate training program in psychology. "Free Draw Cards" involve attempting to persuade other players to vote with you to implement proposals to change your school. The ideas advanced are usually provocative and often controversial, and are taken directly from those suggested by Postman and Weingartner in Teaching as a Subversive Activity.

A more detailed description of the content of these three types of cards follows:

Event Cards:
Examples of these cards include:
1. "Stomach ache. Go to the nurse's office Located 2 spaces behind where you are."
2. "Late for school. Lose a turn."
3. "Fold your hands for one turn"
4. "Busywork assignment. Stay where you are."
5. "Gold Star. Take another card"

Knowledge Cards:
Samples of these items are represented as follows:
1. Implicit Assumption: "Weeding out" a majority of the students is a satisfactory method of producing good scientists and clinicians. (Upon turning the card over, it says "If you disagreed, move ahead two spaces")
2. Implicit Assumption: Knowledge is not the accumulation of brick upon brick of content and information (If you agreed move ahead two spaces)
3. Implicit Assumption: Presentation equals learning: What is presented in the lecture is what the student learns. (If you disagreed, move ahead two spaces)

Free Draw Cards:
Instructions on the "Free Draw Cards" indicate that players will move ahead the same number of spaces as they can get others to agree with them that the recommendations printed on the card should be implemented in their school. (Time limit is 1 minute, then voting occurs). Sample proposals supposedly from the school suggestion box include:
1. "Classify teachers according to their ability and make the lists public."
2. "The teacher should encourage student-student interaction as opposed to student-teacher interaction. And generally he should avoid acting as a mediator or judge of the quality of ideas expressed."
3. "The teacher should measure his success in terms of behavioral changes in students."
4. "Have 'English' teachers 'teach' math, math teachers teach English, social studies teach science, science teach art, and so on.

In the course of play it is possible for a player to move to several different spaces when there is just one throw of the dice, depending upon his answer to a card drawn as a result of landing on an "Event" or "Knowledge" or "Free Draw" space.

Social Psychological Processes: Theoretical Foundations

The use of simulation and gaming to achieve attitude change as an educational objective involves many of the salient variables of social psychology experimentation. Indeed, many games have been used to directly investigate social behavior experimentally: many role-playing games are based on real-world models and become sufficiently realistic to evoke a high level of participation by learners. "Starpower", "Inter-Nation Simulation", "Ghetto", "Career", "Decision-Making" are examples of educational games often characterized by a high level of learner responding. While it has been relatively easy to document achieving educational objectives at Levels I (Receiving) and II (Responding) of Krathwohl's Taxonomy of Educational Objectives: Affective Domain, it has often been very difficult to adequately control and obtain evidence of the direction and content of long lasting attitude changes that presumably result where educational objectives at higher levels of the taxonomy are sought (III. Valuing, IV. Organizing, V. Characterization by a Value Complex). More pervasive and complex attitudes are involved here.

One of the reasons why some educational attitude change efforts are not as successful as they might be may lie in the fact that simulation/game designers may not systematically consider and apply relevant social psychological variables and principles. Accordingly, the objective was sought to directly apply Kelman's theory of social influence (Kelman, 1958) to the design of a game for achieving several objectives with prospective teachers.

Kelman's theory is built on three processes of attitude change: compliance, identification, and internalization. Compliance is a process whereby an individual accepts influence because he expects to gain specific rewards or approval or avoid specific punishments or disapproval (not because he believes in the content) from a specific person or group. Identification occurs when an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or group. The satisfaction from identification

is due to "the act of conforming as such", since it is associated with the desired relationship with an important person or group. There will be more attitude change where the power of the influencing agent is based on his attractiveness to the individual. Internalization is a process that occurs when "the content of the induced behavior--the ideas and actions of which it is composed--is intrinsically rewarding" (Kelman, 1958) The behavior is adopted because it is congruent with his value system.

A social-psychological explaination of the simulation/game is offered in terms of the game cards, which were specifically designed to capitalize on Kelman's three processes of attitude change:

Event Cards: Compliance with the directions on these cards when landing on these spaces is required by the game rules. Players (Prospective teachers) experience the negative consequences of school rules or discipline practices that encourage student compliance or conformity, as well as positive privileges or recognition. The creation of opportunities for occurence of the feelings likely to be associated with positive or negative school events is assumed to lead players to prefer the frequent use of reward rather than punishment as a means to "control" or "discipline" students. Greater sensitivity to the human consequences of school and teacher "management" policies is anticipated to occur through role reversal, since "real" school events "happen" to game players (teachers) as if they were elementary or middle school students.

Knowledge Cards: Identification with a hypothetical "ideal teacher" model (one who is attuned to student interests, beliefs, and assumptions) or identification with attractive or successful game players will encourage the answering of these items correctly (as a "knowledgeable" teacher would) to the extent identification occurs.

Free Draw Cards: Internalization should occur where the credibility of the content of the persuasive message advocated during "counterattitudinal role-playing" is congruent with the "arguer" or "voter's" value system. Identification and compliance processes may also operate to favor attitude change with free draw cards. A persuasive argument rewarded by affirmative votes is likely to be strengthened, with attitudes changing in the direction advocated, although the persuader may not have originally privately held the position.

Several features were incorporated into the game: Counter-attitudinal role-playing could be engaged in, a group would establish "social anchoring" for attitudes towards various

educational issues, the primary influencing agents would be the players themselves, and players would have the coercive power (compliance) of means control (could dispense rewards and punishments through group voting on issues after persuasive attempts by one player), they could serve as successful or attractive models for other players (identification) or the content they introduced in their persuasive arguments or the content provided by the "game cards" could reflect values or ideas compatable with the value systems of the person's playing (internalization).

Linder, Cooper, and Jones (1967) found that cognitive dissonance affects (more attitude change occurs under less incentive) are dependent upon the freedom of the subject not to comply with the discrepant request. The possible detrimental effects of this factor are taken in to account by giving prospective players freedom of choice on the issue of participation. If they elect to participate, the rules of the game, including counter-attitudinal role-playing, will be engaged in by all participants. Thus we avoid the problem of "subject mortality", while simultaneously maximizing the positive benefits of manipulating the perception of freedom while having S's perform acts that will result in immediate feedback and consequences.

Since players come to the game with different goals and needs, there is virtue in simultaneously capitalizing on the operation of seemingly contradictory theories of attitude change in a forced compliance situation. Reinforcement theorists predict a positive relationship between incentive and attitude change, while dissonance theorists predict a negative relationship. We may regard these as being two different bases of attitude change, each relevant under appropriate conditions.

A major aspect of this game is based on the finding of Sherman (1970) that when there is initial behavioral committment to the discrepant act in a forced-compliance situation incentive relates inversely to attitude change, but relates positively in the absence of such committment. Since both conditions will likely be present over the course of the game contest, it would be nice to have these processes impact in a favorable direction

on attitude change. Accordingly, after a "freely adopted" persuasive attempt that receives few or no votes, we would expect the player to actually be more likely to adopt the position advocated. Covering the other possibility, to the extent that his "forced by the game" persuasive attempt is rewarded by affirmative votes, we would expect his attitude to become more favorable towards the issue. We can go even further, predicting that when a player is successful in gaining votes, his behavior may change in direct proportion to the amount of incentive (number of affirmative votes), while at the same time, players who voted affirmatively for his position were doing so at their "own expense" through becoming that much further (relatively, by social judgment and comparison processes standards) away from, the winning space on the board. So affirmative voters may be expected as well to become more favorable towards the issue, due to dissonance effects. Bem would remind us here that both the persuader and the affirmative voter would be likely to make the "observer error" predicted by his theory of self-perception: "I must believe in the issue, because I advocated or voted for it." (Bem, 1967: S infers his attitude after observing his behavior).

We would certainly expect many players to vote for the issue to maintain a satisfying self-defining relationship with an attractive person or sub-group (dyads, etc.), thus providing for identification effects. The content of the positions themselves may allow for internalization to occur wherever a positive vote or advancement of an argument occurs which is primarily responsive to content which the person finds rational, logical, or capable of integration with his existing values. Thus surveillance and salience may become supplemented by the effects of internalization.

A game is a complex situation that does not always permit a desireable degree of rigorous control. Whatever control exits often is the result of conformity to "Instructions" and "Rules", which are effective to the extent that group pressure results in mutual attempts by players to 1) be accommodating, 2) keep the group intact, and 3) to maintain acceptability

(Kiesler Kiesler, 1970, page 39). One of the most desireable features of a game, or of explicit role-playing, is that it capitalizes on the phenomenon of "deindividuation", or the tendency for goup members to become less "civilized" because they feel they are less identifiable (i.e., less likely to have to take personal blame) when in groups (Festinger, Pepitone, and Newcomb, 1952). Although there are often negative consequences of "deindividuation" (failure to help a victim of crime when in a group of onlookers; bystander intervention studies) a postive aspect of this is that a "risky shift" may occur in the group setting. The group, and its members (actors or role-players in a game) may adopt or aquiesce to more radical positions than any one individual would be willing to individually support. At the very least, ease of projection into roles should occur.

Sherif and Hovland's (1961) social judgment theory also offers us additional theoretical underpinning for game designers' frequent reliance on mutually persuasive attempts of players to influence one another. Their central assumption is that judgmental effects mediate attitude change. They conceive attitudes as being phenomenon that the person "scales" or "orders" along a line as a result of several judgments. Thus, most game designs are flexible enough that they may variously allow for <u>one's own decisions</u> and <u>the decisions of others</u> both becoming reference points which may in turn become very strong "anchors" for judging others attitude statments or persuasive communications. When a discrepancy appears and increases between one player's own stand and position advocated by another player or communication, there will be greater opinion change, provided that the advocated stand is not so extreme as to fall within the "latitude of rejection" for a given player. Thus, the ideas of latitudes of acceptance, rejection, and nonacceptance become "social judgment" translations of the concept of "limens" or thresholds from psychophysical experimentation. Attitude change is thus a two-stage process: 1) the person makes a judgment about the position of the persuasive communication relative to his own position; 2) attitude change occurs after this categorization or judgment.

The amount of change depends on the judged discrepancy between the communication and the respondent's own position.

Sherif (1935) had groups of subjects judge the extent of apparant movement of a point of light in a dark room (autokinetic effect). He found that as the S's continued to speak in turn, extreme judgments became less frequent and the estimates converged. (In Allport, 1924, no such effect was found for Ss working alone). Sherif has hypothesized that in this type of ambiguous situation, the others' judgments are used aa a "frame of reference" for the subject's own judgment. That is, the others' judgments define the array of possible judgments for each person. During play of the "School Game", with each subject trying to be accomodating, one should find the most extreme judgments dropping out and more "average" judgments becoming increasingly popular. Group pressure, in this case, induces moderation.

The use of the "School Suggestion Box"-to which anyone could make contributions of ideas to be implemented in the school-capitalized upon the possibilities that the group itself would help define or provide crucial reference points for "anchoring" attitudes, given this element of ambiguity to the idea origin.

Tedeschi offers hope for additional behavioral change through resolving possible objections to our procedure of using rewards and punishments. According to attribution theory, a perceiver will not be able to infer the true intentions of an actor as long as the latter's behavior is believed to controlled by external, non-volitional factors (Jones and Davis, 1967; Kelly, 1967; Bem, 1967). For maximum change, Bem would maintain that the person should perceive his counterattitudinal behavior as tacted (not under reward of punishment control). The "voting" or "payoff" element of the game is a weakness from this standpoint. But Tedeschi offers a possible solution for this problem in that players may manage the impressions others gain of them in such a way as to appear consistent. A self-fulfilling prophesy, or even "bandwagon effect" becomes possible so long as the person makes one affirmative vote at some point in the game. We may apply Tedeschi's principle here: "Behaviors intended to

restore impressions of consistency will be emitted only when the individual believes the observor has perceived two actions as tacted, and, further, as contradictory in their attributional implications." One convincing argument advanced by a player may thereby open up a Pandora's box in his later attempts to maintain an impression of consistency.

Group pressure will be expected to operate as a positive general force in the direction of completion of the game. Players may readily 1) adopt the persuasive role, and/or 2) vote affirmatively on the issues to keep the action going and achieve a winner, which is the obious purpose of the game. We expect the resulting conformity to rules, procedure, and standards as assuring that a minimally viable structure exists as a setting for inducing behavioral change, i.e., the game will be played according to the rules.

This group goal (winning) phenomenon will be operative in possibly several of the following ways:

1) When an individual accepts his group's goal, he will be motivated to work within the group for its attainment. Further, private acceptance of an important group standard (like the group goal) will lead to acceptance and compliance with other group standards. (White and Lippitt, 1968; Schacter et. al., 1951)

2) The individual must understand the group goal. A clear goal enhances conformity to group standards (Ravens and Rietsema, 1957)

3) When group standards are relevant to the group goal, there is greater pressure for conformity (Schachter, 1951).

4) To the extent that the group can be successful in attaining its goals, the individual will conform (Thomas, 1957).

5) The individual who contributes to the success of the group will be highly valued. Members who have higher status in the group will have a greater influence on the others (Lippitt, Polansky, Redl, and Rosen, 1952).

6) When cooperation and interdependence will help to reach the group goal, conformity will greater (Deutsch, 1949; Thomas, 1957).

Thus, in the foregoing six examples, we see how the individual may respond to group pressure because the group is serving a normative function for him.

Brehm (1966) notes that a person tries to reestablish threats to his behavioral freedom. In the course of the game, threats to "freedom of movement" may arise by 1) getting a small number on the die, or by 2) being sent back one or two spaces when landing on a "punitive" space (Event). The "skill" element of the game is designed to tap the motivation of "psychological reactance". The best way a player has of reestablishing his lost "freedom of movement" on the game board is through being very persuasive during the opportunities for counterattitudinal role-playing and thereby successful in moving ahead rapidily.

In summary, we will attempt to demonstrate how Kelman's theory of attitude change might be applied to a social influence situation by citing results of an attempt to 1) design a simulation structure based on his theory and 2) obtain field testing and/or research data on the probable effectiveness of this specific simulation as an instrument of social influence.

The implicit bias of this social influence attempt might be briefly summarized: 1) to produce "radical" educators who will innovate to use: a) "discovery" learning experiences (like educational games:; b) student-centered instuctional strategies; and 2) to enhance awareness of alternative assumptions about the educational process based on the viewpoints of "students", Carl Rogers (Freedom to Learn), Postman and Weingartner (Teaching as a Subversive Activity), and Greer and Rubinstein (Will the Real Teacher Please Stand Up?).

Summary of Variables and Hypotheses:

Independent Variable:

Participation in or observation of play of the "School Game" was the independent variable.

Dependent Variables:

The dependent variables were measured by responses of Ss to a 20 item attitude scale developed by Thiagarajan (1972) which contains statements about educational games. The subject responds in one of five categories to each item: Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. An analysis of responses to parts of the attitude scale was also conducted, based upon a classification of items into four areas.

General Hypothesis:

As a result of participation in and/or observation of the "School Game" Ss will agree with statements that favorably describe experiences with educational games and will generally disagree with statements that describe negative experiences or characteristics associated with educational games.

Four sub-hypotheses were advanced:

1) Learning: As a result of participation in or observation of play of the game, Ss should generally respond with agreement to statements that associate learning with game playing. The attitude scale statments used to evaluate this hypothesis will all contain some form of the verb "to learn" and the noun "game" in the same sentence. (Items 1, 4, 5, 6, 14, 16)

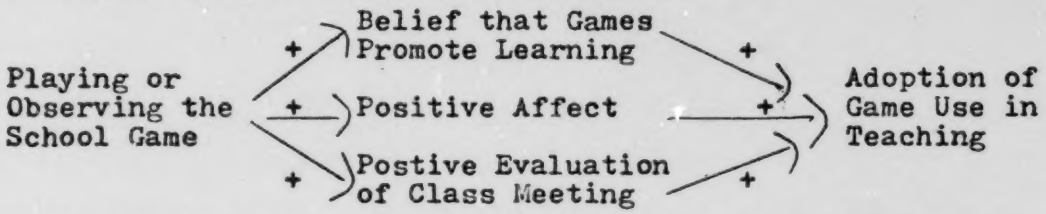
2) Affect: As a result of participation in or observation of play of the game, Ss should generally respond with agreement to statements that associate pleasant or satisfying feelings with game playing. The statements used to evaluate this hypothesis will include items describing emotional reactions. Statements will associate games with either positive or negative descriptions as follows: "games usually stink", "happy"; "are for children", "make me uptight"; "fun"; "too competitive";

"would have to force me to play"; "drive me up the wall"; "beautiful"; "nobody goes to sleep". Since this scale contains 6 negative and 5 positive statements, support for the hypothesis would be evidenced by disagreement with negative statements, and agreement with positive statments. (Item numbers are 2, 3, 7, 8, 9, 11, 13, 17, 18)

3) Class Meeting Evaluation: As a result of particpation in or observation of play of the game, Ss should generally favorably rate the class meeting. Support for the hypothesis would be evidenced by general disagreement with the statement "I'll be very happy if we play no more instructional games," and agreement with the statement "This was an exciting instructional session". (Items 19 and 20)

4) Game Use in Teaching: As a result of "participation in" or "observation of" play of the game, Ss will be likely to agree with statements that teachers should use more games. Agreement with items 10 and 12 would evidence support: "I think my teacher should use more games", and "If I were a teacher, I'd use a lot of learning games."

A causal model (Blalock, 1971) with "path diagrams" of this process might take the following theoretical form:



The instrument was converted to a dichotimized nominal scale for the purposes of data analysis. Neutral responses were arbitrarily dichotomized, with equal proportions assigned to positive and negative categories. The null hypothesis being tested is that the proportion of positive responses in the population is .50. The research hypotheses were all directional, with the expectation advanced that the proportion of favorable responses occuring in this sample would be significantly different from a chance level of .50 in a positive direction. It should be carefully noted that this analysis rests somewhat tenuously upon the following two assumptions about both the population and the method of sampling. It was assumed that (1) the proportion of

positive responses on this attitude scale was .50 in the population, and (2) the subjects particpating in the simulation were a random sample from this population. No empirical baseline data were available for establishing that this assumed proportion is represented by any "real" group of subjects. Additionally, the classroom providing subjects was randomly selected for study only in the sense that it happened to be available at the time subjects were needed for this investigation.

Experimental Procedures:

After an initial pilot study to "debug" the original version, the revised School Game was experimentally tested for its impact on attitudes towards simulation/gaming with the prediction that these processes would be seen as legitimate and worthwhile didactic devices. A graduate educational psychology course in personality theory at Indiana University provided subjects for experimentation. The instructor was not present during the game. To provide freedom of choice and thereby minimize "psychological reactance", the experimenter emphasized that class members were free to decide whether or not they wanted to play the game. No students left the classroom, and two groups of 7 were then formed around 2 game boards, while one class member occasionally observed but also slept. Game playing took approximately 45 minutes, and then a Likert Scale containing 20 statements about instructional games was administered to all students in the class (N=15).

Results:

Items on an attitude scale adapted from the "GAME Game" (Thiagarajan, 1972) were keyed to deal with four major areas of attitudes towards instructional simulations. Total scale reliability was .78 (Testat alpha). Subscale reliabilities were: Learning = .41; Affect = .66; Class Meeting Evaluation = .89; and Game Use in Teaching = .70. A Z test of proportions, testing the hypothesis that attitudes were positively significantly different from neutral, resulted in the following:

Learning: Six test items measured attitudes generally related to the issue "Do games promote learning?". Responses were not significantly different from neutral on this issue, indicating that graduate students enrolled in a content-oriented educational psychology course generally did not agree with statements that games promote learning.

Several statistically significant findings were obtained.

Affect: Ten items employed statements about the "goodness" or "badness" dimensions of games. When data was analyzed to test the degree to which respondents believed that games promote positive affect (feelings), the null hypothesis was rejected at the P .001 level.

Class Meeting Evaluation: Two statements assessed the degree to which participants felt that this was a worthwhile experience, i.e., "an exciting instructional session". The probability of chance responses as favorable as those obtained was less than .001.

Game Use in Teaching: Two items measured the degree to which participants believed that a teacher's role should include using games in the classroom (e.g., "If I were a teacher, I'd use a lot of learning games"), with responses significantly different from neutral at $P<.001$.

Summary:

Participant's attitudes were significantly positive ($P<.001$) towards statements that 1) games promote positive affect, and they 2) favorably rated the class meeting, and 3) players generally agreed with statements that teachers should use games in teaching, but responses were not significantly different from neutral in the belief that 4) games promote learning.

One possible interpretation of these results might be that: 1) Kelman's theory of social influence processes can be successfully applied to simulation/gaming design where attitude change is at issue; and 2) effort should be devoted during debriefing to emphasize or redefine learning as including changes in behavior that especially deals with attitudes and affect. In the context of a content-oriented course attended by graduate educational psychology students who are well-aware of established learning principles and definitions, this data suggests that attitudinal or affective learning experiences from "games" are not internalized (congruent with the student's value system) as "in fact" reflecting learning.

Discussion:

The purpose of this investigation was to field test the design of a simulation/game which had deliberately considered social psychological theory and research during the design phase. The game resulting from this effort was observed to be characterized by three features:

(1) players attempted to persuade others to vote for adoption of "radical" proposals

(2) counterattitudinal role playing was engaged in by the persuaders since several of the proposals did not represent the persuader's actual positions on the issues, but merely reflected a viewpoint they adopted in order to win votes to advance along the playing board. Several Ss were observed to react to the proposals with astonishment and/or expressed immediate disagreement, but then continued with a persuasive attempt to get other players to vote for the issue.

(3) A formal structure was created by the game so that a forum for suspended judgment, and/or listening and evaluating the merits of radical proposals was followed by active responding with immediate consequences (voting) for all participants.

The first field test evaluation of the "School Game" could generally be regarded as an attempt to obtain some evidence that playing the game is in some way a positive or enjoyable experience, i.e., the "School Game" should have intrinsic merit as a game in that it should be fun to play.

Informal observational data on play of the game suggested that participants enthusiastically assumed the rules as required, played by the rules, and arrived at a winning or loosing outcome within 45 minutes of play. In the sense of achieving the objective of creating a playable and enjoyable game, this design effort seemed to be successful from these informal observations.

The results obtained are worthwhile in suggesting possibilities for future reserach but an adequate test of the hypotheses has not been conducted here because of the limitations imposed by three major factors:

(1) Empirical evidence was not obtained to support the assumption of (a) random sampling, and (b) the assumption that

population proportion of favorable responses is in fact .50.

(2) The extremely small number of subscale items employed in evaluating the four hypotheses renders their reliability extremely suspect, necessitating at least the addition of several items to the instrument before an adequate data base exists for the determination of subscale reliabilities.

(3) Several plausable alternative hypothesis exist which are equally capable of accounting for the results obtained in this first field test.

A more detailed discussion of these limitations follows.

In this study, the Z test of proportion rests on the assumption under the null hypothesis that a chance level (.50) is generally descriptive of attitudes held in population of interest. Since data on the instrument was not collected prior to its use with "School Game" participants, we have not "anchored" the scale to the responses of persons who have not played the game. Interpretation of post game responses of participants is difficult without independently obtained baselines for comparison. Since the results obtained were subjected only to comparison with a theoretical standard, the "neutral point" and other scale values of the instrument are found to be lacking an empirical basis for interpretation.

The extremely limited number of items on the "subscales" renders their reliability suspect. The measurement of the impact of the game upon beliefs and feelings about educational games as measured by the whole attitude scale is perhaps the most reliable among those obtained, but it is based upon a fairly small sample of behavior (20 questions). The Testat alpha program used to obtain the reliability estimates employs Kuder-Richardson reliability which is a measure of homogeneity, andit is most appropriately applied when the test is unifactor, i.e., "a relatively pure measure of a single trait". Since the Kuder-Richardson view of test error is in terms of inconsistency of performance on the items within the test, if the test is measuring more than one trait or factor (as the use of subscales implies), it is difficult to say to what extent they reflect intraindividual differences in the traits involved. Following this logic, the Kuder-Richardson procedures would be most appropriate

if the attitude scale were unifactor, where the 20 item scale would be treated as a "global" measure of attitude towards educational gaming. Given the extremely limited number of items on the test, insufficient data is available here for statistical resolution of the issue of whether or not the scale is unifactor or multifactor.

It should be noted that the Kuder-Richardson formula contains a correction for bias in small samples of the form $(\frac{n}{n-1})$, where n = the number of items in the test. Since this correction factor is multiplied times the remaining elements in the formula to estimate reliability, it can readily be seen that where a two item test is concerned (as in the "Evaluation of Class Meeting" subscale), the correction term obtained $(\frac{2}{2-1} = 2)$ doubles the reliability estimate. The inflation produced in the 2-item test case should therefore be regarded as an invalid estimate of reliability.

Campbell and Stanley classify the design employed in this first field test of the "School Game" as a "one-shot case study." Several sources of both internal and external validity are not ruled out by this procedure, and the findings should be regarded as merely descriptive of events occuring on a single occasion, with no foundation provided for inference or generalization. As a result of this investigation.we do not know if participants' attitudes have been changed, or if Ss are in any way reliably different from individuals who have not experienced the simulation.

As noted, we have no scientific basis for generalization of these findings. Unless data were collected on post-test performance for both experimental and control groups, we cannot rule out a number equally plausable alternative hypotheses, including:

(1) Attitudes towards educational games are generally positive, i.e., favorable attitudes on these issues are not the direct result of the "School Game".

(2) Participation in this educational game immediately prior to the S's being asked his attitude towards games is not a necessary prerequisite to holding favorable attitudes towards the issues measured.

(3) Other educational games or experiences are of equal or greater effectiveness in forming or changing attitudes towards the issues measured by the instrument.

(4) The format of the attitude instrument itself produces generally favorable results because of the response set of subjects. For example there may be a tendency of S's to agree with statements presented favorably, or to select "disagree" items because they are on the right side of the scale.

(5) Sampling bias and testing error have produced these results.

Since the design employed rests upon tenuous assumptions, and does not allow for a comparison or contrast with a group not exposed to the "School Game", an adequate evaluation of the hypotheses as advanced can not be considered to have been conducted in this investigation. Without comparison or control groups, the simultaneous occurence or historical precedence of one event (the game) with or before another event (attitude scale responses) is not a sufficient basis from which to infer causality. At a minimum, comparison of post test data for randomly assigned experimental and control group subjects would provide a basis for the evaluation of the hypotheses. Comparison of mean responses of experimental and control groups on the instrument would avoid the loss of power inherent in collapsing the Likert scale data into a dichotomized nominal scale, while sources of internal and external invalidity could be taken into account by the experimental design.

After accepting the severe limitations imposed by the design, we may have some small basis for optimism. If we were to generously assume that error and bias are not the major cause of our findings, and if we were to also grant that it may be true that students generally hold favorable attitudes towards educational games, and if we further allowed that the simulation itself did not induce more favorable attitudes than other possible experiences, it might still be fair to describe participant's attitudes as being or remaining generally favorable towards games after exposure to the "School Game". Although the game has not here been established

as capable of producing favorable attitudes, on this one occasion it is at least has not been associated with negative attitudes towards educational gaming. This offers some basis for hoping that future experimental tests of hypotheses of interest might ultimately vindicate the "School Game" as a viable instrument of attitude change.

Although not the immediate concern of this initial field test, it was hoped that if the "School Game" were found to work successfully as a game, eventually an evaluation of theoretical issues in attitude change might be conducted through variation of game features.

Future investigations of the "School Game" might randomly assign subjects to experimental and control conditions to evaluate hypotheses of interest. Beyond conducting a more adequate resolution of the issues raised here, the impact of the game on attitudes towards the actual issues confronted during counter-attitudinal role playing might be directly measured. Effects of game features could be measured by systematic variation of the game format. For example, post-game attitudes towards the issues could be compared between a group required to engage in counterattitudinal role playing and a group given freedom to choose with which proposals they would attempt persuasion. The impact of placing constraints on player's freedom (or the role of psychological reactance) versus free choice in selecting proposals could then be compared through analysis of post game attitude scores.

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Appendix A: Questionnaire

This page contains 20 statements about instructional games. Read each statement and record your response to it by circling the appropriate letter, on the IBM answer sheet.

A = strongly agree
B = agree
C = undecided
D = disagree
E = strongly disagree

1. Learning is too serious for games.
2. Instructional games usually stink.
3. I am happy whenever I play a game.
4. Things you learn from a game are usually worthless.
5. You learn more things from a game than any other way.
6. Games are a relaxed way to learn.
7. Games are for children.
8. Most games make me uptight.
9. Games are fun.
10. I think my teacher should use more games.
11. Games are too competitive.
12. If I were a teacher, I'd use a lot of learning games.
13. People would have to force me to play a game.
14. I'd much rather learn from books than from games.
15. Learning games drive me up the wall.
16. Games make everyone learn.
17. Games are beautiful.
18. Nobody goes to sleep during a game session.
19. I'll be very happy if we play no more instructional games.
20. This was an exciting instructional session.

Impact of the "School Game" on Willingness to Give and Receive Feedback

Another experiment was conducted to evaluate the impact of the interpersonal relationships surrounding the counter-attitudinal role-playing of the "School Game". The instrument selected was based on Luft and Ingham's "Johari Window" model of interpersonal effectiveness. A paper and pencil instrument was adapted from Johnson, which has the subject place dots on the X and Y axes of a square which forms the outline of the Johari Window to show how willing the respondent feels both himself and others are to 1) receive feedback and 2) self-disclose. Based on these responses to the instrument two lines may be drawn to show the four panels of the Johari window. Each"window" or item results in two scores. This instrument consisted of two "Johari windows" or items, in which the respondent rated both himself and others.

I. Self: a. Willingness to receive feedback
b. Willingness to self-disclose

II. Group: a. Willingness to receive feedback
b. Willingness to self-disclose

Scores could range from 0 to 70.

The "process" variable of interest was degree of trust or openness produced among participants as a result of playing the School Game. The "openness" of interpersonal relationship was measured by a paper and pencil instrument which has the subject place points and then draw lines on a graph which inllustrates the four quadrants of the "Johari window".

A completely randomized factorial 2·2·2· design was employed, which allowed comparison of pre and post test scores, ratings of self versus ratings of the group, and measures of "willingness to self-disclose" versus "receptivity to feedback". Subjects from an undergraduate educational psychology course in "Human Development and Learning" were randomly assigned to 3 groups of 5, 5, and 6 subjects each, for a total N = 16. Since playing the School Game requires one set of materials (game board, players, dice, situation cards, etc.) for every 4 to 8 sugjects, assignment of subjects to groups was necessary.

Summary Analysis of Variance Table

Source	SS	df	MS	F
1. A Pre-Post	855.937	1	855.937	5.338*
2. B Self-Group	25.377	1	25.377	.158
3. C Self-Disclosure-Feedback	76.567	1	76.567	.477
4. AB	27.213	1	27.213	.168
5. AC	10.703	1	10.703	.067
6. BC	9.583	1	9.583	.0597
7. ABC	29.047	1	29.047	.181
8. W cell	19242.69	120	160.356	

* $.01 < p < .05$

$({}_{.05}F_{1,120} = 3.92)$

$({}_{.01}F_{1,120} = 6.85)$

It was hypothesized that post test performance would reflect more openness in the willingness to give and receive feedback when compared to pre test scores. No significant differences were hypothesized for the main effects Self versus Group or the dimensions of Self-Disclosure versus Feedback. No significant interactions were hypothesized.

A significant difference was found between pre and post test performance, confirming the hypothesis that post test scores as measured by the Johari Window instrument would reflect greater willingness to give and receive feedback after participation in the simulation. A discussion and interpretation of these findings is witheld at this time, however.

The data is currently being reanalyzed to assure that appropriate error terms for testing the mean squares were used as required in a repeated measures design.